DOCUMENT RESUME

ED 122 471 LC 082 849

AUTHOR Thurlow, Martha L.; Turnure, James E.
TITLE Children's Knowledge of Time and Money: Effective Instruction for the Mentally Retarded.
PUB DATE 76
NOTE 25p.; Paper presented at the American Educational Research Association meeting (San Francisco, California, April 19-23, 1976)

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS Daily Living Skills; *Educable Mentally Handicapped; Elementary Secondary Education; Exceptional Child Research; Mentally Handicapped; *Money Management; Number Concepts; Program Effectiveness; Teaching Methods; *Time; *Trainable Mentally Handicapped

ABSTRACT

Instructional units on time and money were presented to 249 educable and trainable level mentally retarded children. Pretesting showed that Ss had a poorer understanding of time and money concepts than 229 nonretarded controls of the same MA. Significant performance increases from pretest to posttest resulted in the retardates' posttest scores being above control Ss', and in some cases, approaching the level of their CA peers. (Author/CL)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED122471

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

EC

CHILDREN'S KNOWLEDGE OF TIME AND MONEY:

EFFECTIVE INSTRUCTION FOR THE MENTALLY RETARDED

Martha L. Thurlow and James E. Turnure

University of Minnesota

Department of Psychoeducational Studies
Pattee Hall
University of Minnesota
Minneapolis, Minnesota 55455

EC 08 2849

Session No. 11.10

Children's Knowledge of Time and Money: Effective Instruction for the Mentally Retarded

Martha L. Thurlow and James E. Turnure

University of Minnesota

The knowledge and skills an individual has in the areas of time and money are critical aspects of his adjustment to the environment. By the time a child reaches the first grade, he generally has a fair amount of knowledge about time and money. Even forty-five years ago, a study by Probst (1931) found that 94% of a population of kindergarten children knew the number of hands on a clock, 30% knew the time at noon, and 37% knew the number of pennies in a nickel. Templin (1958) found similar levels of knowledge in the middle 1950's. Even for more complex skills, Pollio and Gray (1973) recently found relatively high knowledge levels. When given rather difficult change-making problems, 3rd graders were not only making change, but also beginning to give relatively efficient solutions.

Most children apparently are able to pick up much of their knowledge about time and money from casual or incidental exposure to the concepts. In school, the concepts of time and money typically are presented within the mathematics curriculum, with the focus being on the computational aspects of these areas. It seems that time and money are presented within the math curriculum mainly to show the practical applications of arithmetic processes like addition and subtraction. In other words, the child is presented with problems that ask things like "How many hours is it from 2:00 to 6:00?" and "How

much is 5¢ + 2¢?" The assumption underlying this approach seems to be that children acquire the conceptual basis of knowledge in the areas of time and money "naturally," as a result of their interactions with the environment. While this assumption may be true for most normal children, it does not seem to be true for retarded individuals. In a 1960 investigation, Marshall and Magruder found a significant correlation between money knowledge and IQ. Lower IQ children knew less about money than higher IQ children.

Unfortunately, instruction on time and money is usually presented to retarded students in the same manner as it is to nonretarded students. This approach generally results in retarded children trying to master arithmetic computation and knowledge of time or money simultaneously, or even more commonly, in teachers skipping the pages related to time and money in their mathmatics curriculum. Yet, special educators would like to see the retarded child (at least the retarded child labeled as "educable") have time and money skills comparable to those demonstrated by nonretarded children of the same chronological age (CA).

The goal of equivalent performances by same-age retarded and nonretarded individuals, however, is not generally seen as a realistic instructional objective. Both Kolstoe (1970) and Peterson (1973), who provide comprehensive guides of the "age-appropriate" potentials of the retarded, suggest that retarded children of primary level age (8 - 10 years) will master instruction on the equivalence of coins and telling time to the hour or half hour. Skills such as counting

money, making change, and telling time to the minute are reserved for older children. These expectations seem to be below those held for nonretarded children.

Instruction on time and money specifically designed for children with learning difficulties is needed. The instruction must be developed specifically to teach the concepts to the retarded individual in a way that insures mastery and promotes retention and transfer. At the University of Minnesota's Research and Development Center, an attempt was made to develop such instruction.

Instructional Units on Time and Money

The Time and Money units developed at the University of Minnesota initially were designed for children designated as "educable." Field-testing later verified their useability and potential effectiveness with trainable retarded students.

The developers of both the Time and Money units assumed that the instruction had to take into account the learning difficulties of retarded children, as well as their limitations in experience (Jordan, 1962). The instruction was to be embedded within other instruction. The instruction was to be concrete (with real clocks and real money), yet provide opportunities to associate the real things with pictures, which of course, are frequently used in standardized tests. The instruction was to be relational rather than rote and avoid the problems arising when skill related content is put into a drill and practice format. The instruction was to be based on careful task analyses to meet the sequencing and structuring needs of retarded children.

Although the basic goals of the instruction were to have retarded children telling time and counting money at the same time that their nonretarded peers were, the instruction did not start with drill and practice at the levels of telling time and counting money. The instruction started at even more basic levels -- the recognition of a clock and the hands on a clock, for example, or the recognition of the U.S. coins. Table 1 presents the organizations of the Time and Money units developed at the University of Minnesota, and the major concepts presented in each.

Insert Table 1 about here

Number skills are typically considered as prerequisite to any instruction on time or money. It appears that when time and money are being taught to young children, either number skills must be taught successfully first, or initial instruction must be independent of number skills. Since teaching retarded children such skills as counting, one-to-one correspondence and many-to-one correspondence is considered to be quite difficult, it seemed that initial instruction had to be independent of number skills. The Time and Money units were both developed to start at levels not requiring counting and other number skills. Such skills could be taught separately by the teacher, and then introduced in their applications to time and money.

The Time and Money units are based upon language and vocabulary rather than on number concepts. The units begin by giving meaning to

the vocabulary associated with time or money. The approach of the units is to stress simple, specific meanings first and then systematically to elaborate on these meanings to reach the full and commonly accepted meaning of a word. As the necessary vocabulary foundation is obtained, related skills are introduced. In taking this approach, both vocabulary and skill development are enhanced.

With this somewhat unique approach to presenting time and money concepts, the developers of the units initiated an investigation to assess the knowledge levels of nonretarded and retarded children with respect to time and money, and to evaluate the effectiveness of the Time and Money units for increasing the test scores of retardates in these areas.

Assessment of Knowledge Levels

Standardized tests were considered inappropriate for testing knowledge of time and money in this investigation since none were found to deal with time and/or money exclusively, and those that included these concepts contained only a few items related to each area. In addition, standardized tests frequently ignored lower levels of knowledge such as the identification of clocks and the recognition of coins. For these reasons, tests were developed to assess knowledge of time and money.

Tables 2 and 3 present the items in the Time and Money tests, respectively. The Time test was a thirty item test that assessed the student's knowledge of general time concepts (e.g., "morning," "early"), the clock, telling time to the hour, the half-hour, and the minute.

The Money test was a forty item test that evaluated knowledge of money by testing recognition, relative value, exact value, equivalence, counting money, and making change.

Insert Tables 2 and 3 about here

Subjects. The Time test was given to 112 nonretarded children and 69 educable mentally retarded (EMR) children. The Money test was given to 117 nonretarded children, 64 EMR children, and 115 trainable mentally retarded (TMR) children. The nonretarded children were from kindergarten through third grade classrooms.

The EMR subjects who received the Time and Money units were approximately the same age as the third grade nonretarded children tested, and their mental age (MA) was similar to that of the kindergarten children. The TMR subjects who were given the Money test were much older than the nonretarded children (mean CA = 14.5 yrs). Their MA level, however, was slightly below that of the nonretarded kindergarten children. The average IQ's of the EMR and TMR subjects were 71.1 and 42.4, respectively.

Results. Tables 4 and 5 present the results from both the nonretarded and retarded subjects on the Time and Money tests. The percentages of children responding correctly on certain key items in each of the tests are also presented. (Complete test data are available in Thurlow, Turnure, Taylor, Krus, Howe, & Troup, Note 1, and Nelson, Troup, Thurlow, Krus, & Turnure, Note 2).

Insert Table 4 about here

On the Time test, the nonretarded children were able to answer 46%, 66%, 60%, and 75% of the 30 items correctly in kindergarten, first, second, and third grades, respectively. Unfortunately, these data did not show the expected linear increase across grades one and two. The EMR children answered 42% of the items correctly, a level slightly below that of their nonretarded MA peers. It is interesting to note that on the individual items, the retarded children scored at a level below all grade levels of nonretarded children (except in telling time to the half hour and to a five-minute interval, where the EMRs showed performance levels slightly above those of the kindergarten children). Clearly, the EMR children had a long way to go to match their CA peers, the third-graders, on items which required them to actually tell time.

Insert Table 5 about here

The results from the Money tests, which are shown in Table 5, revealed that nonretarded children in kindergarten through third grade answered 40%, 60%, 77%, and 82% of the 40 items correctly. The EMR children answered 35% of the items correctly before receiving instruction in the Money unit, and the TMR individuals correctly answered 23%. These scores represent levels below both the EMR's and the TMR's MA peers. On the individual items, the retarded subjects performed at or below the level of their MA peers. This was true even on those items requiring the recognition and identification of the U.S. coins.

Effectiveness of the Time and Money Instruction

In order to evaluate the effectiveness of the Time and Money units for increasing the test scores of the retarded individuals, the retarded children were given instruction in the Time or Money unit and then retested on the appropriate test. Instruction was presented in the Time unit for from four to eight weeks and in the Money unit for from 12 to 20 weeks.[1]

Time Unit. On the Time test, the EMR children answered 56% of the items correctly after receiving instruction, compared to 42% before instruction (see Table 4). This posttest performance level was comparable to that obtained by the nonretarded subjects scoring at a level one step above the kindergartners (the second graders). The pretest to posttest increase in number correct, which is described here in percentages, was statistically significant. This is quite impressive given the fact that subjects did not have sufficient time to proceed through all of the instruction. The overall pretest to posttest increases of the EMRs receiving the Time unit are also presented in Figure 1, in comparison with a control group of EMR children who did not receive the instruction from the Time unit. Clearly, the slope of the line for the Experimental group reflects the impressive (and statistically significant) gains made by this group from pretest to posttest. (See Krus, Thurlow, Turnure, & Taylor, 1974b, for more detailed descriptions of comparisons with control groups.)

Insert Figure 1 about here

Investigation of performances on individual posttest items revealed that the retarded students were approaching the performance levels of nonretarded children of the same mental age, and in some cases, surpassing them. The posttest scores for the Time test items in Table 4 were 75%, 96%, 92%, 92%, 76%, and 83%. The performance on the item requiring the student to tell time to a five-minute interval after the hour (e.g., 2:20) was 83%. This is amazing in comparison to the 6% level of their MA peers and even in comparison to the 47% level of their CA peers.

Money Unit. On the Money test (see Table 5), the EMR children answered 62% of the items correctly after receiving instruction, compared to 35% before instruction. This posttest level approached the level of the second grade children, clearly above the performance of their MA peers, although not quite reaching the level of the CA peers. These data are also presented in Figure 2, which depicts pretest to posttest changes for the EMRs receiving the instruction and EMRs in a control group. Statistical tests revealed that the increases made by the children receiving the Money unit (i.e., Experimentals) were significant while those made by the children not receiving the unit (i.e., Controls) were not. (See Krus, Thurlow, Turnure, & Taylor, 1974a, for further discussions of the comparisons between experimentals and control groups.)

Insert Figure 2 about here

The posttest scores for the Money test items in Table 5 were 88%, 88%, 71%, 71%, 29%, and 4%, not quite as impressive as the Time test results. Here again, few children had received the instruction related to the last items in Table 5.

On the Money test, the TMR individuals correctly answered 41% of the items after receiving instruction, as compared to 23% before instruction. This change in performance reflected a change from a performance level substantially below that of their MA peers to a level just above that of their MA peers. The TMR subjects were also limited by the fact that they did not have sufficient time to receive all of the Money instruction. In fact, most had only received instruction through Book Two, which deals with the recognition of the coins and bills.

The posttest scores for the TMRs on the Money test items in Table 5 were 73%, 82%, 33%, 23%, 2%, and 0%. These data clearly demonstrate that instruction increased performance levels. On those items related to instruction that had been received (label nickel, name more than 3 coins), the TMR individuals were approaching a level of mastery. In fact, the performance increases by TMR students were most noticeable on the first 16 items of the complete Money test, the items corresponding to the instruction they received.

Other Populations. The Time and Money units have also been used with other populations. Although rigorous evaluation has not been undertaken, the units appear to have great potential for use with disadvantaged youth and adult retarded individuals. Even young

preschool children seem able to benefit from the instruction.

Summary

The results of the present investigation indicated that nonretarded children's knowledge of time and money generally increases with grade level. Furthermore, on the basis of the items reported by Probst in 1931, it appears that the knowledge level of nonretarded children has remained relatively constant over the past 40 years. Without specific instruction other than that possibly found in mathematics textbooks, the knowledge that retarded individuals have of time and money is below that of nonretarded children of a similar mental age.

The results of the present study further indicated that instruction can be designed to promote the acquisition of time and money concepts by retarded individuals. The Time and Money units increased the retarded students scores significantly on most test items. Generally, the instruction brought the retarded students up to a level above that of their MA peers, although still below that of their CA peers. One might expect that after longer periods of exposure to the units, performance levels of retarded individuals would increase even more.

The results of this investigation have important implications for the education of retarded individuals not only because the developed units provide instruction in areas important to the adjustment of retarded children to the environment (Kolstoe, 1970), but also because the instructional techniques employed in the Time and Money units are

ones which can be used to develop similar instruction in other content areas (cf. Taylor, Thurlow, & Turnure, 1974; Thurlow, Taylor, & Turnure, Note 3, Thurlow, Turnure, & Howe, Note 4).

Reference Notes

1. Thurlow, M. L., Turnure, J. E., Taylor, A. M., Krus, P. H., Howe, R., & Troup, J. B. An assessment of the effectiveness of the Money, Measurement and Time Program for EMR children (Research Report #88). Minneapolis, Minn.: University of Minnesota, Research, Development and Demonstration Center in Education of Handicapped Children, March 1975.

2. Nelson, J. T., Troup, J. B., Thurlow, M. L., Krus, P. H., & Turnure, J. E. An assessment of the effectiveness of the Money, Measurement and Time Program for TMR students (Research Report #90). Minneapolis, Minn.: University of Minnesota, Research, Development and Demonstration Center in Education of Handicapped Children, May 1975.

3. Thurlow, M. L., Taylor, A. M., & Turnure, J. E. The Money, Measurement and Time Program: Teacher's introduction. Unpublished instructional material (available from Thurlow, 5 Pattee Hall, University of Minnesota, Minneapolis, MN 55455).

4. Thurlow, M. L., Turnure, J. E., & Howe, R. Let's teach vocabulary: Guidelines for the development of elaboration-based vocabulary instruction (Development Report #4). Minneapolis, Minn.: University of Minnesota, Research, Development and Demonstration Center in Education of Handicapped Children, August 1975.

References

Jordan, T. E. The exceptional child. Columbus, Ohio: Charles E. Merrill, 1962.

Kolstoe, O. P. Teaching educable mentally retarded children. New York: Holt, Rinehart, & Winston, 1970.

Krus, P. H., Thurlow, M. L., Turnure, J. E., & Taylor, A. M. Summative evaluation of the Money Unit of the Money, Measurement and Time Program. Minneapolis, Minn.: University of Minnesota, 1974. (ERIC Document Reproduction Service No. ED 107 004) (a)

Krus, P. H., Thurlow, M. L., Turnure, J. E., & Taylor, A. M., Summative evaluation of the Time with the Clock Unit of the Money, Measurement and Time Program. Minneapolis, Minn.: University of Minnesota, 1974. (ERIC Document Reproduction Service N. 107 007) (b)

Marshall, H. R., & Magruder, L. Relations between parent money education practices and children's knowledge and use of money. Child Development, 1960, 31, 253-284.

Peterson, D. L. Functional mathematics for the mentally retarded. Columbus, Ohio: Charles E. Merrill, 1973.

Pollio, H. R., & Gray, R. T. Change-making strategies in children and adults. Journal of Psychology, 1973, 84, 173-179.

Probst, C. A. A general information test for kindergarten children. Child Development, 1931, 2, 81-95.

Templin, M. C. General information of kindergarten children: A comparison with the Probst study after 26 years. Child Development, 1958, 29, 87-96.

Taylor, A. M., Thurlow, M. L., & Turnure, J. E. Elaboration as an instructional technique in the vocabulary development of EMR children. Minneapolis, Minn.: University of Minnesota, 1974. (ERIC Document Reproduction Service No. ED 104 056)

Footnotes

This paper was prepared for presentation at the annual meeting of the American Educational Research Association (San Francisco, April 1976).

The research presented in this paper was supported in part by a grant to the University of Minnesota Research, Development and Demonstration Center in Education of Handicapped Children (OEG-0-332189-4533-032) from the U. S. Office of Education.

[1]The evaluation of the Time and Money units actually encompassed much more than simply a comparison of the performances of retarded individuals and nonretarded individuals. During the evaluation of each unit, the performances of experimental children were compared with the performances of two control groups. In addition, community location comparisons were undertaken, and teacher evaluation data were collected. Complete descriptions of the field-tests can be found in Krus, Thurlow, Turnure, & Taylor, 1974a, 1974b, and Thurlow, Turnure, Taylor, Krus, Howe, & Troup, Note 1.

Table 1

Descriptions of the Time and Money Units

The Time with the Clock Unit consists of four books of instruction which develop the key concepts related to time telling. Following instruction on time terms not directly related to the clock (day, night), the Unit proceeds to develop the concepts and skills necessary for telling time on the hour, on the half hour, and to the minute.

Book One	Book Two	Book Three	Book Four
light, dark	clock, face, hands	thirty	minute
day (daytime), night (nighttime)	long hand, short hand	half hour (half past)	minutes
today, tonight	o'clock	hour, half hour	minute hand, hour hand
morning, afternoon	hour	(second, second hand)	minutes after (quarter after)
early, on time, late			minutes before (quarter to)

The Money Unit consists of four books of instruction which develop money concepts by beginning at a general awareness level, and proceeding to the levels of recognition, relative value, and finally to exact value. Several experiences in counting money and making change are included in the instruction. The four books are to be used sequentially, with a branching point from Book Two into Book Four provided so that the children may apply their recognition skills in a store setting before proceeding to instruction on the exact value of money.

Book One	Book Two	Book Three	Book Four
trade	coins	trade	store, (shopping center), shopper
money	penny, nickel	penny, cent, ¢	customer, clerk
spend, save, bank	dime	nickel	pay, cash register
	quarter	change	price (cost), price tag
	half dollar	dime	cash, cash register, cashier
	bills	quarter	charge, check
	one dollar bill, five dollar bill	half dollar, fifty cent piece	change
		dollar, $	
		five dollar bill, ten dollar bill, twenty dollar bill	

Table 2

Time Test Items

1. Labels dark. *Is it usually light outside or dark outside at night?*
2. Labels night. (Show picture.) *What time of the day do you think it is in this picture?*
3. Labels morning. (Show picture.) *What part of the day do you think it is in this picture?*
4. Identifies afternoon. *What part of the day comes after morning?*
5. Identifies after. (Show picture.) *This girl is getting her hair cut. Point to the picture that shows her hair after her haircut.*
6. Identifies before. (Show picture.) *This little girl is getting her hair cut. Point to the picture that shows her hair before her haircut.*
7. Identifies early. *When you get to school before it starts, are you getting to school early or late?*
8. Identifies late. *When you get to a movie after it starts, are you getting there early or late?*
9. Identifies clock. (Show picture.) *Point to the pictures that show what you would use to find out the time.*
10. Defines clock. *Why do people look at clocks?*
11. Labels face. (Show clock.) *What's the whole front side of the clock called?*
12. Labels hands. (Show clock.) *What are these called?*
13. Labels numbers. (Show 3 cards.) *What number is this?*
14. Defines hands. *What do the two hands of a clock look like?*
15. Defines o'clock. *At 4 o'clock, where is the long hand pointing to?*
16. Tells time on hour. (Show clock.) *I'll show you a clock and I want you to tell me what time it says.*
17. Demonstrates o'clock. (Show toy clock.) *Move the hands on this clock so it says 5 o'clock.*
18. Demonstrates movement of hands. (Show toy clock.) *This clock says 3 o'clock. Now I'm going to move the minute hand all the way around the clock. Show me where the hour hand will move to.*
19. Tells time to half hour. (Show toy clock.) *What time does this clock say?*
20. Demonstrates half hour. (Show toy clock.) *Move the hands on this clock to show 5:30.*
21. Identifies half hour. (Show toy clock.) *This clock shows 7:00. Show me what it will be in a half hour.*
22. Counts by fives. (Show picture.) *Point to the large numbers to show me how to count the minutes around the clock. Show me how to count by fives around the clock.*
23. Identifies minute hand. (Show toy clock.) *Point to the hand that is called the minute hand.*
24. Defines half hour. *Where does the minute hand point to when it's 4:30?*
25. Tells time 5 minutes after (2:20). (Show toy clock.) *Tell me what time this clock says.*
26. Tells time exact minute after (4:11). (Show toy clock.) *What time does this clock say?*
27. Demonstrates exact minute after (3:18). (Show toy clock.) *Move the hands on this clock to show 18 minutes after 3.*
28. Tells time 5 minutes before (2:45). (Show toy clock.) *What time is it on this clock?*
29. Tells time exact minute before (8 to 3). (Show toy clock.) *What time does this clock say?*
30. Demonstrates minutes before (9 before 5). (Show toy clock.) *Now, move the hands on the clock to show 9 minutes before 5.*

Table 3

Money Test Items

1. Describes trading situation. *Here's a pencil. Now you give me your pencil and I'll give you mine. Tell me, what did we do?*
2. States money when related to store. *When you buy some candy at a store, what do you trade for it?*
3. Selects pictures of money. (Show picture.) *Look carefully at all the pictures on this page and find everything that is money. Point to the pictures of money.*
4. States save in response to definition. *What's it called when you put money away to use it later?*
5. Labels a nickel. (Show nickel.) *What's this?*
6. States penny in response to definition. *Now, tell me the name of the only brown coin.*
7. States dime in response to definition. *Which coin is the smallest? Think about how big the coins are and tell me the name of the smallest coin.*
8. Selects dime as coin that buys most. (Show picture.) *Now look at these three coins -- show me the coin that buys more than the others.*
9. Selects pictures of half-dollar. (Show picture.) *Look at everything on this page. Point to the half-dollar.*
10. Names more than 3 coins. *What are the names of some coins that you know?*
11. Orders 5 coins by value. (Show 5 coins.) *Put these five coins in order of how much they could buy.*
12. Selects coins buying more than nickel. (Show picture.) *Look at all the coins on this page. Show me the coins that buy more than the nickel.*
13. Describes why fake bill not real. (Show picture.) *Look carefully at this picture. It looks something like a picture of real money, doesn't it? Think about what real money looks like -- what's different on this?*
14. States "bill" labeling 20 dollar. (Show picture.) *We could call this twenty dollars, but twenty dollars isn't it's full name. What's the full name of this money?*
15. Selects picture of 5 dollar bill. (Show picture.) *Look at all the pictures and point to the five dollar bill.*
16. States "fifty dollar bill." (Show picture.) *What's this called?*
17. Labels shopper as "customer." (Sho picture.) *We can call this man a shopper because he is buying something at a store. Now, can you tell me another name for a shopper?*
18. Labels a cash register. (Show picture.) *What is this a picture of?*
19. Describes relative value of quarter. *If you had a quarter, could you buy a new bicycle at a store?*
20. States penny is "one cent." *How many cents are there in a penny?*
21. Reads 5¢. (Show picture.) *What does this say?*
22. Changes nickel for 5 pennies. (Show coins.) *Now we're going to play a short game. Pretend that all this money is yours. Now, you give me change for my nickel.*
23. Responds "change" to definition. *If you only have a nickel, but you need five pennies, what do you have to do?*
24. States "dime" is 10 pennies. *What coin buys the same as 10 pennies?*
25. States quarter is "25 cents." *How many cents are there in a quarter?*
26. States "50 pennies" in half dollar. *How many pennies are there in a half dollar?*
27. States 50 cent piece. (Show picture.) *This is a picture of a half dollar. Now you tell me, what's another name for the half dollar?*
28. States dollar is "100 cents." *How many cents are there in one dollar?*
29. Reads $2. (Show picture.) *What does this card say?*
30. Reads $2.30. (Show picture.) *Tell me what this card says.*
31. States 10 dollar bill = 2 fives. *What bill buys the same as 2 five dollar bills?*
32. Counts 5 nickels. (Show picture.) *Count all this money out loud and tell me how much there is.*
33. Counts combinations of coins (20¢). (Show coins.) *Count all this money and tell me how much there is.*
34. Counts bills and coins ($2.32). (Show picture.) *Count all this money and tell me how much there is.*
35. Counts $1 bill and coins ($2.35). (Show picture.) *Count all this money and tell me how much there is.*
36. Labels price tag. (Show picture.) *This tells us how much the bat costs. What do we call this thing?*
37. States that cash is money. *When you pay with cash -- what do you give the store clerk?*
38. Labels check. (Show picture.) *What's this a picture of?*
39. States "change" to definition. *Let's say that you went to the store to buy some pop. The pop costs 10 cents and you gave the clerk 25 cents. What's the money called that the clerk gives you back?*
40. Makes change 12¢ from quarter. (Show picture and coins.) *Now let's pretend that you're a store clerk -- so this is the money at your store. I want to buy this pen from you. It costs 12 cents. Here's the quarter that I'm going to give you to pay for the pen. Look at the picture. The pen costs twelve cents and I gave you a quarter. Now you count my change as you give it back to me.*

Table 4

Time Test Results

(Percent Responding Correctly)

	Nonretarded (n=112)				EMR (n=69)	
	Kg[a]	1st	2nd	3rd[b]	Before Instruction	After Instruction
OVERALL	46	66	60	75	42	56
Identifies before	87	96	96	97	62	75
Identifies clock	100	100	100	100	90	96
Labels hands	77	81	76	83	62	92
Tells time on hour	52	96	76	97	46	92
Tells time to half hour	10	81	24	77	15	76
Tells time 5 minutes after (2:20)	6	12	12	47	10	83

[a]Nonretarded Kg = MA peers of EMRs

[b]Nonretarded 3rd graders = CA peers of EMRs

Table 5

Money Test Results

(Percent Responding Correctly)

	Nonretarded (n=117)				EMR (n=64)		TMR (n=115)	
	Kg[a]	1st	2nd	3rd[b]	Before Instruction	After Instruction	Before Instruction	After Instruction
OVERALL	40	60	77	82	35	64	23	41
Labels nickel	53	73	92	95	67	88	46	73
Names more than 3 coins	38	72	88	100	23	88	48	82
Orders 5 coins by value	23	65	96	90	23	61	10	33
States dime is 10 pennies	27	54	76	90	14	71	7	23
Counts bills and coins ($2.32)	10	23	52	86	10	29	0	2
Makes change 12¢ from quarter	3	8	12	48	0	4	0	0

[a]Nonretarded Kg = MA peers of EMRs and TMRs

[b]Nonretarded 3rd graders = CA peers of EMRs

Figure 1

Mean Number Correct on Time Test

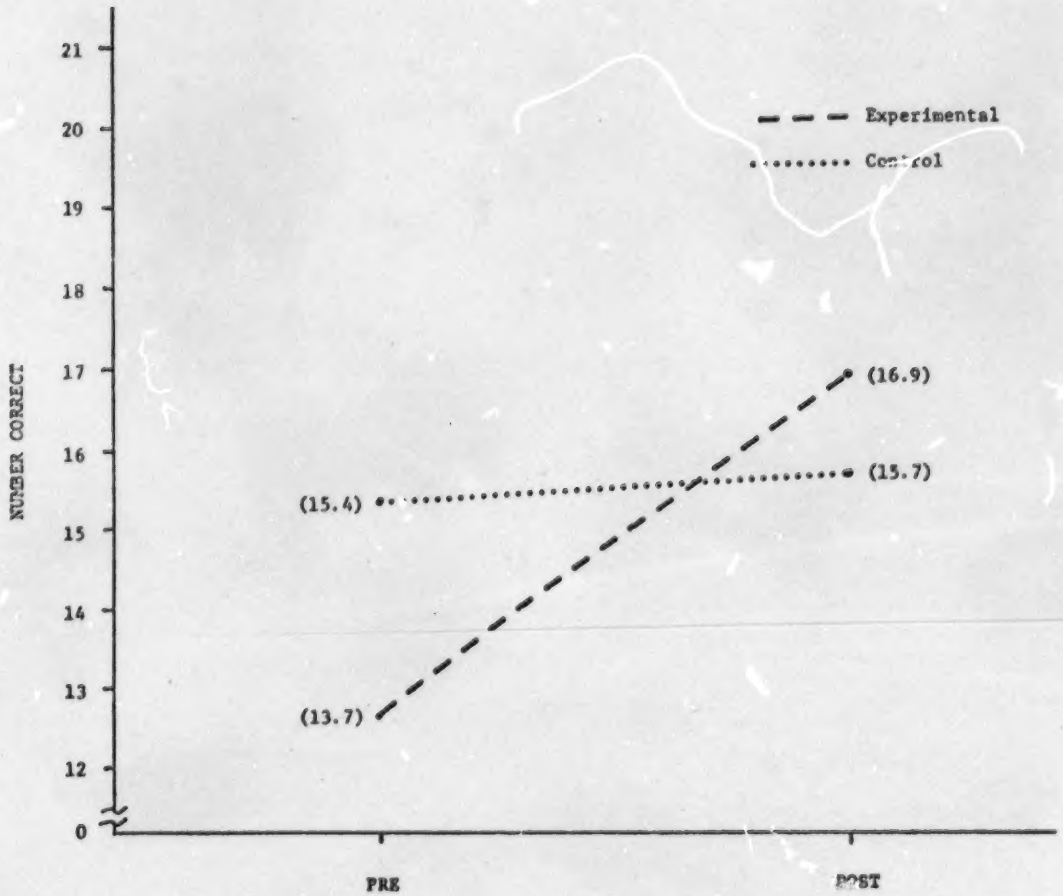

Figure 2

Mean Number Correct on Money Test